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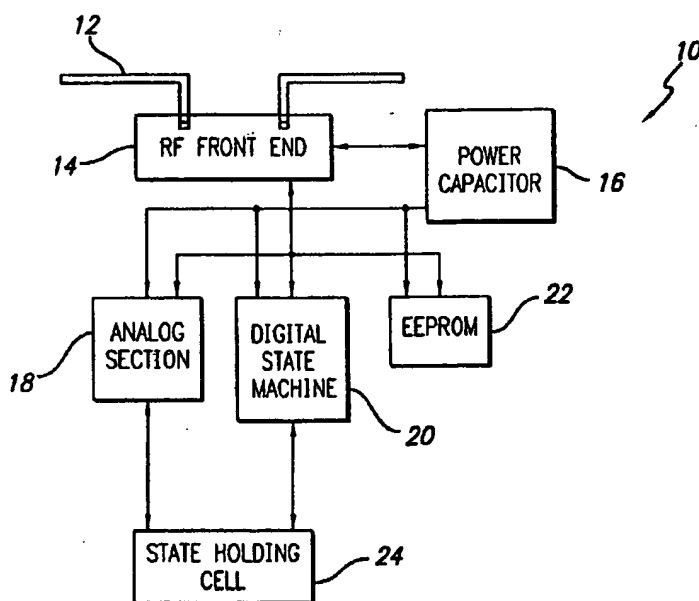
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(54) Title: PASSIVE RFID TAG THAT RETAINS STATE AFTER TEMPORARY LOSS OF POWER



(57) Abstract: The present invention provides an RFID transponder that includes a state holding cell (24) that maintains the present state of the RFID transponder during temporary losses of power. After power is restored to the RFID transponder, the state holding cell restores the present state to the RFID transponder so that transactions with an RFID interrogator can continue without having re-transmit redundant commands. The RFID transponder further comprises an RF front end (14) adapted to receive an interrogating RF signal. An analog circuit (18) is coupled to the RF front end and is adapted to recover analog signals from the received interrogating RF signal. The analog circuit provides state information defining a desired state of the RFID transponder corresponding to the analog signals. A digital state machine (20) is coupled to the analog circuit and adapted to execute at least one command in accordance with the state information. A memory (22) is coupled to the digital state machine and is adapted to store and retrieve digital data

responsive to the at least one command executed by the digital state machine. A power capacitor (16) is coupled to the RF front end and derives a voltage rectified from the interrogating RF signal to charge the power capacitor. The power capacitor thereby provides electrical power for the analog circuit, the digital state machine and the memory. The state holding cell (24) is coupled to the analog circuit and the digital state machine and is adapted to maintain the state information during a loss in power provided by the power capacitor due to lapse in receipt of the interrogating RF signal by the RF front end.

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SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN,
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INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

WPI Data, EP0-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 173 899 B1 (ROZIN ALEXANDER) 16 January 2001 (2001-01-16) column 3, line 65 -column 4, line 21; figure 1	1,7-15, 21-24
X	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 09, 30 September 1997 (1997-09-30) & JP 09 135481 A (TOKAI RIKI CO LTD), 20 May 1997 (1997-05-20) abstract	1,7-15, 21-24
A	GB 2 333 495 A (PLESSEY TELECOMM) 28 July 1999 (1999-07-28) page 2, paragraph 2; figures page 8, line 11 - line 21 page 14, line 17 -page 15, line 3 -/-	1-24

☒ Further documents are listed in the continuation of box C.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 39 07 519 A (TEXAS INSTRUMENTS DEUTSCHLAND) 20 September 1990 (1990-09-20) column 1, line 8-10, 22-34, 44-50 column 2, line 37-43 column 3, line 29-33 -----	1-24
A	US 5 214 409 A (BEIGEL MICHAEL L) 25 May 1993 (1993-05-25) column 2, line 13 - line 23 column 5, line 19 - line 23; figure 1 -----	1-24

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6173899	B1	16-01-2001	NONE
JP 09135481	A	20-05-1997	NONE
GB 2333495	A	28-07-1999	GB 2333493 A 28-07-1999 AU 2179399 A 09-08-1999 AU 2179599 A 09-08-1999 WO 9938108 A1 29-07-1999 WO 9938109 A1 29-07-1999
DE 3907519	A	20-09-1990	DE 3907519 A1 20-09-1990 AT 98409 T 15-12-1993 DE 69004999 D1 20-01-1994 DE 69004999 T2 21-04-1994 DK 386718 T3 14-02-1994 EP 0386718 A2 12-09-1990 US 5283529 A 01-02-1994
US 5214409	A	25-05-1993	AT 220816 T 15-08-2002 AU 665797 B2 18-01-1996 AU 3234393 A 28-06-1993 DE 9218817 U1 26-10-1995 DE 69232683 D1 22-08-2002 DE 69232683 T2 27-03-2003 DK 615645 T3 11-11-2002 EP 1251452 A1 23-10-2002 EP 0615645 A1 21-09-1994 ES 2076132 T1 01-11-1995 JP 7504771 T 25-05-1995 PT 615645 T 31-12-2002 US 5257011 A 26-10-1993 WO 9311517 A1 10-06-1993